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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,693	09/17/2003	Ravinder Aggarwal	ASMEX.358DV1	6237

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EXAMINER	
ADAMS, GREGORY W	

ART UNIT	PAPER NUMBER
3652	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/665,693	AGGARWAL ET AL.	
	Examiner	Art Unit	
	GREGORY W. ADAMS	3652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 & 10-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister (US 6,481,956) (previously cited) in view of Tanaka (US 6,395,094) (previously cited) and further in view of Ozawa et al. (US 5,810,538) (previously cited).

With respect to claims 1-2, 4-6, 10, 12-14, 19-22, Hofmeister discloses-

- a front docking port 24 located on a outside surface of a first substrate handling chamber 13;
- a robot arm 32 located in a first substrate handling chamber configured to access a buffer station B1-B4 and using Z-motion;

- a loadlock chamber A, B joined to a first substrate handling chamber 13; and
- a buffer station separate from a loadlock chamber A, B, a buffer station having a rack defining multiple shelves for holding substrates, FOUP cassettes 34, and wherein shelves of a buffer station rack have a pitch (10mm).

Hofmeister's buffer B1-4 is in a first substrate handling chamber, and does not disclose a buffer station directly adjacent a first substrate handling chamber being purged with inert internal environment separate from a first substrate handling chamber, or relative difference.

Tanaka discloses a buffer station 44, 46 directly adjacent a first substrate handling chamber 28, a buffer station being selectively purgeable with an inert internal environment (indicated generally as 94) separate from a first substrate handling chamber, said buffer "designed to be usually communicated with the transfer chamber 28 and to airtightly separate a space for housing therein the wafer W from the transfer chamber 28 during the preheating or cooling of the wafer" (C6/L33-37) "to prevent a gas, which has been released or exhausted from the surface of the object during preheating, and a cooling gas, which has been used for cooling, from being leaked into the transfer chamber." C3/L42-47. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hofmeister to include a buffer station directly adjacent a first substrate handling chamber being purged with inert internal environment separate from a first substrate

handling chamber, as per the teachings of Tanaka, to contain leakage into a transfer chamber.

Ozawa et al. discloses a reduced pitch between an origination (C4/L45-53) and destination 18 such that a handler, e.g. robot arm, must account for said differences. Moreover, a skilled artisan will understand that if there is a difference in pitch one must be greater than the other. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hofmeister's racks to include a reduced pitch as is well because where there is a difference there must be one reduced, e.g. less than the other. Ozawa et al. recognizes the transfer of multiple wafers from one location having one pitch to be placed in a wafer boat of different pitch allowing increase wafer production during one boat cycle-through. C2/L45-65. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hofmeister et al. to include a buffer station rack having a reduced pitch relative to FOUP shelves, as per the teachings of Ozawa et al., to reduce boat cycle-through times.

With respect to claims 3 & 16, Hofmeister discloses loadlock chamber A, B is located between a first substrate handling chamber 13 and a rear substrate handling chamber 15.

With respect to claims 11 & 23, Hofmeister does not disclose a robot arm configured to employ a variable pitch end effector. Ozawa et al. discloses a variable pitch end effector (C4/L45-53) that allows multiple wafers from smaller cassettes to be placed in a single wafer boat allowing increase wafer production during one boat cycle-

through. C2/L45-65. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the robot arm of Hofmeister et al. to include a variable pitch end effector, as per the teachings of Ozawa et al., to reduce boat cycle-through times.

With respect to claims 15 & 17-18, Hofmeister a loadlock chamber having a loadlock rack with a substrate capacity of less than one third of a substrate capacity of a cassette including 1 to 7 substrates. C3/L35-45.

Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Tanaka and Ozawa et al. and further in view of Fishkin (US 6,082,948)

With respect to claim 7, Hofmeister discloses a buffer station having an internal volume and does not disclose an internal volume less than or equal to about 18.3 liters. Fishkin et al. discloses a buffer station volume of 10 liters when wafers are 200 mm in diameter which facilitates rapid evacuation. C6/L30 Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hofmeister to include an internal volume less than or equal to about 18.3 liters, as per the teachings of Fishkin, to increase throughput.

With respect to claim 8, Hofmeister discloses a buffer station rack configured to support twenty-five 300 mm silicon wafers.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Tanaka and Ozawa et al. and further in view of Edwards (US 5,944,857) (previously cited).

With respect to claim 9, Hofmeister discloses a loadlock chamber having an internal volume and does not disclose an internal volume less than or equal to about 9.156 liters. Edwards discloses loadlocks configured to have as small a volume as possible, "preferably not more than about six to eight liters and preferably only about 4.5 to 5 liters" (C11/L47-60) to improve small batch throughput. C3/L25-30. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hofmeister to include an internal volume less than or equal to about 9.156 liters, as per the teachings of Edwards, to increase small batch throughput.

Response to Arguments

Applicant's arguments filed March 3, 2008 have been fully considered but they are not persuasive. The examiner does not agree with the Applicants interpretation.

Applicant concedes the claims and limitations are disclosed in the cited prior art arguing that the combinations are non-obvious. Applicant first argues Tanaka cannot be combined because Tanaka solves a problem not found in Hoffmeister. Whether a modifying reference solves a problem explicitly noted in a primary reference is irrelevant. The question is whether one skilled in the art would have combined the references together. In this case the cited prior art are clearly analogous as both process wafers using buffer chambers accessed by robot arms. More specifically, both buffer wafers during transfer to/from process chambers. Finally, Tanaka solves a problem with buffers not previously addressed in the art by locating Hoffmeister's buffer chambers to a position external a transfer chamber, requiring a separate vacuum

means. Whether Hoffmeister's apparatus could handle extreme cooling or heating is irrelevant because claims 1-23 do not specifically call for said features.

Tanaka's reasoning is to exhaust gas created during cooling, a well known feature in semiconductor processing, that can be contained separate from a transfer chamber. C3/L42-47; C6/L33-37. Applicants arguments directed to Tanaka's cooling pins are irrelevant because Hoffmeister discloses holding multiple wafers. See Applicants arguments page 9, lines 15-23. Thus, arguments directed to the Aswad reference will not be addressed because it was not used to reject claims 1-23.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Hoffmeister discloses storing wafers in a buffer station B1-B4 and FOUP cassette 26, 34. Ozawa discloses that there are differences between "a wafer accommodating pitch of the wafer cassette and a wafer accommodating pitch of the boat 18." A skilled artisan would understand Ozawa as solving the problem of having pitch differences, i.e. one greater, one lesser, between origination and destination. Hoffmeister discloses an origination and destination. And, Ozawa would apply equally if claim 10, line 14 to recited –the shelves of the buffer station rack have an **increased** pitch relative to the shelves of the FOUP cassette--. (Emphasis added.) Ozawa discloses an increased pitch, the feature Applicant relies upon for patentability.

Applicants arguments with respect to claims 7-9 are directed to features disclosed in the cited prior art which are addressed above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY W. ADAMS whose telephone number is (571)272-8101. The examiner can normally be reached on M-Th, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saul Rodriguez can be reached on (571) 272-7097. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Saúl J. Rodríguez/
Supervisory Patent Examiner, Art Unit 3652

/G. W. A./
Examiner, Art Unit 3652
4/8/2008